CLAIMS

What is claimed is:

1.   A computer-implemented method of producing a 3-D image file, the method comprising the steps of:

generating graphics instructions which define image-related characteristics of a first 3-D image frame, wherein a graphics instruction can be used to instruct a display software to render a characteristic of a 3-D image frame;

generating image commands corresponding to the graphics instructions the image commands including graphics instruction reference data and graphics instruction argument data; and

transferring the image commands to an output 3-D image file;

wherein the output file includes information to instruct the display software to display the original 3-D image frame so as to be viewable from multiple viewpoints.

2.   The method of Claim 1, the method further comprising the steps of:

generating image commands corresponding to graphics instructions which represent a second 3-D image frame; and

transferring the image commands representing the second 3-D image frame to the output 3-D image file;

wherein the output file includes information to instruct the display software to display the first 3-D image frame and the second 3-D image frame into a sequence of 3-D image frames.

3.   The method Claim 1, further comprising the step of linking a library including a set of procedures containing storage information and rendering information for each of the graphics instructions;

4.   The method of Claim 1, further comprising the step of translating each of the commands into graphics instructions concurrently with the storage of the commands.

5.   The method of Claim 1, wherein the display software includes a rendering tool.

6.   The method Claim 5, further comprising the step of rendering a sequence of images with the rendering tool, said rendering tool using the instructive information stored in the output 3-D image file.

7.   The method of Claim 6, wherein rendering the sequence of images includes the step of matching up the commands with corresponding graphics instructions.

8.   The method of Claim 1, further comprising the step of streaming the output 3-D image file across a network.

9.   The method of Claim 8, wherein the network is the Internet.

10.   The method of Claim 8, further comprising the step of compressing the output file before it is streamed across the network.

11.   A method of viewing a 3-D imagery, the method comprising:

(a)   reading a movie file command, the command containing graphics instruction reference data and graphics instruction argument data;

(b)   using the movie file command to reference a corresponding graphics library instruction template;

(c)   building a graphics instruction by linking the graphics instruction data to the graphics library instruction template; and

(d)   executing the graphics instruction using a display software;

wherein the graphics instruction contains information for rendering a characteristic of a 3-D image so as to be viewable from multiple viewpoints.

12.   The method of Claim 11, comprising the step of repeating steps (a) through (d) for a plurality of movie file commands.

13. The method of Claim 12, wherein a frame is comprised of the plurality of movie file commands.

14. The method of Claim 11, further comprising the steps of reading a main file header.

15. The method of Claim 12, wherein the step of building a graphics instruction includes using information contained in the main file header.

16. The method of Claim 12, further comprising the step of reading at least one characteristic from a display list, the display list containing at least one characteristic to be rendered in a plurality of image frames.

17. A memory for storing data, the data including information for instructing a display software to display a characteristic of a 3-D image so as to be viewable from multiple viewpoints, the memory comprising:

a graphics instruction data field that contains reference information corresponding to a single graphics instruction, the single graphics instruction containing information for instructing the display software to display a characteristic of the 3-D image; and

an argument data field defining at least one argument, the argument containing data to be used by the single graphics instruction in generating the 3-D image characteristic.

18.   The memory of Claim 17, further comprising a command size data field defining a size of a graphics rendering command, the 3-D movie command including graphics instruction reference information and graphics instruction data.

19.   The memory of Claim 17, wherein the argument data field comprises an argument size data field defining a size of the argument.

20.   The memory of Claim 19, wherein the argument size field includes both data defining the size of the argument and data defining a type of the argument.

21.   The memory of Claim 19, wherein the argument field further comprises an argument type data field defining a type of the argument.

22.   The memory of Claim 18, further comprising:

at least one frame, the frame including at least one set of command size, graphics call, and argument fields; and

a frame header stored in the memory corresponding to each frame, the frame header including general information concerning the frame.

23.   The memory of Claim 17, further comprising a main header stored in the memory, the main header containing information concerning all of the at least one frames.

24.   The memory of Claim 23, wherein the header comprises:

an argument type data field stored in the memory defining an argument type; and

an argument size data field stored in the memory defining an argument size.

25.   The memory of Claim 22, further comprising a display list stored in the memory, wherein the display list includes at least one data field containing a characteristic that will be rendered in each of the frames.

26.   An apparatus producing a 3-D image file, the apparatus comprising:

a translation application for translating a data set into graphics instructions, the data set containing information about the contents of at least one 3-D image, and each graphics instruction containing information for instructing a display software to display a characteristic of a 3-D image;

a graphics converter for converting the graphics instructions into movie file

commands, each movie file command including a reference to a corresponding graphics

instruction and graphics instruction argument data; and

a movie file recorder for recording a plurality of movie file commands in an

output 3-D image file;

wherein the output 3-D image file contains information for instructing a

rendering software to render a 3-D imagery, so as to be viewable from multiple

viewpoints.

27.   The apparatus of Claim 26, wherein the movie file commands include

integer representations of graphics instructions.

28.   The apparatus of Claim 26, further comprising a buffer, wherein the movie

file commands are first written to a buffer and subsequently transferred from the buffer

to the output 3-D image file.

29.   The apparatus of Claim 28, wherein the output 3-D image file includes

image frames, the image frames including a plurality of movie file commands and

wherein the movie file commands are written to the buffer until a complete frame is

written to the buffer, after which the frame is transferred from the buffer to the output

file.

30. The apparatus of Claim 26, further comprised of graphics display software to display graphics instructions, wherein the graphics converter passes graphics instructions to the display software simultaneously with passing movie file commands to the movie file recorder.

31. The apparatus of Claim 30, wherein the graphics converter first converts the graphics instructions into movie file commands, and subsequently converts the movie file commands into the corresponding graphics instructions to be passed to the display software.

32. The apparatus of Claim 31, wherein the display software includes a graphics rendering tool.

33. An apparatus for viewing a 3-D imagery, the apparatus comprising:

a graphics library hash table for referencing a movie file command to a graphics instruction, the movie file command containing a reference to a graphics instruction and argument data for the graphics instruction, and the graphics instruction including information for instructing a display software to display a characteristic of a 3-D image so as to be viewable from multiple viewpoints;

a movie manager connected to the display software for translating a movie file command into a graphics instruction by referencing the corresponding graphics instruction on the graphics library hash table; and

the display software for displaying the graphics instruction.

34.   The apparatus of Claim 33, wherein the hash table contains references to a plurality of graphics instructions and corresponding movie file commands, and the movie manager translates a plurality of movie file commands into corresponding graphics instructions.

35.   The apparatus of Claim 33, wherein the reference to the graphics instruction is an integer, and wherein that integer is referenced in the corresponding movie file command.

36.   The apparatus of Claim 33, wherein the display software includes graphics rendering tool.

37.   The apparatus of Claim 36, wherein the graphics rendering tool renders a plurality of graphics instructions in a sequence.

38.   The apparatus of Claim 33 wherein the graphics instructions are OpenGL instructions.

39.   An apparatus for of producing a 3-D image file, the apparatus comprising:

a translation application for translating a data set into graphics

instructions;

a means for converting a graphics instruction into a movie file command,

the graphics instruction including information for instructing a display software to display

a characteristic of a 3-D image, and the movie file command including graphics

instruction reference information corresponding to a graphics instruction and graphics

instruction argument data; and

a means for recording a movie file command in an output 3-D image file;

wherein the output 3-D image file contains information for instructing a

display software to display a 3-D imagery, so as to be viewable from multiple

viewpoints.

40.   The apparatus of Claim 39, further comprised of a means for converting a

plurality of graphics instructions into movie file commands.

41.   The apparatus of Claim 40, further comprised of a means for recording a

plurality of movie file commands in an output 3-D movie file.

42.   The apparatus of Claim 41, wherein the plurality of movie file commands

is recorded in the output 3-D movie file in a pre-determined sequence.

43.   The apparatus of Claim 39, wherein the movie file command includes an integer representation of the corresponding graphics instruction and argument data for the graphics instruction.

44.   A computer data signal for instructing a display software to display a characteristic of a 3-D image so as to be viewable from multiple viewpoints, the signal embodied in a carrier wave, the signal comprising:

a graphics instruction data field that contains reference information corresponding to a single graphics instruction, the single graphics instruction containing information for instructing the display software to display a characteristic of the 3-D image; and

an argument data field defining at least one argument, the argument containing data to be used by the single graphics instruction in generating the 3-D image characteristic.

45.   The signal of Claim 44, further comprising a command size data field defining a size of a graphics rendering command, the 3-D movie command including graphics instruction reference information and graphics instruction data.

46.   The signal of Claim 44, wherein the argument data field comprises an argument size data field defining a size of the argument.

47.   The signal of Claim 46, wherein the argument size field includes both data defining the size of the argument and data defining a type of the argument.

48.   The signal of Claim 46, wherein the argument field further comprises an argument type data field defining a type of the argument.

49.   The signal of Claim 45, further comprising:

at least one frame, the frame including at least one set of command size, graphics call, and argument fields; and

a frame header corresponding to each frame, the frame header including general information concerning the frame.

50.   The signal of Claim 44, further comprising a main header, the main header containing information concerning all of the at least one frames.

51.   The signal of Claim 50, wherein the header comprises:

an argument type data defining an argument type; and

an argument size data field defining an argument size.

52.   The signal of Claim 49, further comprising display list information, wherein the display list includes at least one data field containing a characteristic that will be rendered in each of the frames.